Application No. 09/636,565
Reply to Office Action of April 30, 2003

REMARKS

Claims 1-51 and 53-54 are pending in this application. No new matter has been added.

Claim Rejections Under 35 U.S.C. § 103(a)

Rejection – Claims 1-8, 10-14, 34-40, 43, 47-48, 50 and 53-54

Claims 1-8, 10-14, 34-40, 43, 47-48, 50 and 53-54 have been rejected under 35 U.S.C. § 103(a) as being obvious over WO 96/27896 ("Lang") in view of either Bill Schweber or U.S. Pat. No. 6,084,250 (Justel *et al.*), hereinafter, "Justel," or U.S. Pat. No. 6,069,440 (Shimizu *et al.*), hereinafter, "Shimizu). The Examiner takes the position that Lang discloses lighting means including a white light-emitting panel which emits a polychromatic with light with high radiant energy in the violet/blue wavelengths band and with low residual energy in the red wavelengths band, the lighting means do not disturb the light intensifier night vision imaging system even if the white light-emitting source is not filtered in the red wavelengths. The Examiner states that Lang discloses the claimed invention except for the white light-emitting diode, but that any of Schweber or Justel or Shimizu teaches a white light-emitting diode or white LED(s). It is the Examiner's position that it would have been obvious to modify well known incandescent lamps or bulbs with well known white LED(s). The Examiner also takes "Official Notice" of equivalence of incandescent lamps or bulbs and white LED(s) for their use in general illumination purposes and that the selection of any of these "known equivalents" would be within the level of ordinary skill in the art. It is further the Examiner's position that it would have been obvious to modify Lang to include white LED(s) with phosphorus coatings for desired frequency outputs.

Applicants respectfully traverse the rejection of claims 1-8, 10-14, 34-40, 43, 47-48, 50 and 53-54.

Present Invention

The present invention is directed to a combination of lighting means and a light intensifier nigh vision imaging system. The lighting means include a white light-emitting source having at least a white light-emitting diode or a white light-emitting panel which emits a polychromatic white light with high radiant energy in the violet/blue wavelengths band and with low residual energy in the red wavelengths band. The lighting means do not disturb the light intensifier night vision imaging system even if the white light-emitting source is not filtered in the red wavelengths.

The present invention is also directed to a method to illuminate an aircraft instrument panel or an element capable of coming into a pilot's field of vision when the pilot uses a light intensifier night vision imaging system. The method includes the step of using, as illumination means, a white light-emitting source comprising at least a white light-emitting diode or a white light-emitting panel which emits a polychromatic white light with high radiant energy in the violet/blue wavelengths band and with low residual energy in the red wavelengths band, that does not disturb the light intensifier night vision imaging system even if the white light-emitting source is not filtered in the red wavelengths.

The present invention is also directed to a method for retrofitting an aircraft lighting system comprising incandescent lamps so as the aircraft lighting system is compatible with a light intensifier night vision imaging system. The method includes the step of replacing at least part of the incandescent lamps with white-light-emitting diodes emitting a polychromatic white light with high radiant energy in the violet/blue wavelengths band and low residual energy in the red wavelengths band that do not disturb a light intensifier night vision imaging system even if the white light-emitting source is not filtered in the red wavelengths.

The present invention is also directed to a method for retrofitting a system of position lights, landing lights, anti-collision lights or flight training lights including incandescent lamps, so as the system is compatible with a light intensifier night vision imaging system. The method includes the step of replacing each incandescent lamp with a plurality of white light-emitting diodes emitting a polychromatic white light with high radiant energy in the violet/blue wavelengths band and low residual energy in the red wavelengths band, that do not disturb a

light intensifier night vision imaging system even if the white light-emitting diodes are not filtered in the red wavelengths.

The present invention is also directed to lighting means for aircraft lights, compatible with a light intensifier night vision imaging system, especially for position lights, landing lights, anti-collision lights or flight training lights. The lighting means include a plurality of white light-emitting diodes arranged on a printed circuit, emitting a polychromatic white light with high radiant energy in the violet/blue wavelengths band and low residual energy in the red wavelengths band, that do not disturb a light intensifier night vision imaging system even if the white light-emitting diodes are not filtered in the red wavelengths.

The present invention is also directed to lighting means for an aircraft cockpit or instruments panel, compatible with a light intensifier night vision imaging system. The lighting means include a ramp of white light-emitting diodes emitting a polychromatic white light with high radiant energy in the violet/blue wavelengths band and low residual energy in the red wavelengths band, that do not disturb a light intensifier night vision imaging system even if the white light-emitting diodes are not filtered in the red wavelengths.

The present invention is also directed to a lighting system including means of lighting in the visible range, means of lighting in the infrared range and switching means to make a choice between a lighting position in the visible range and a lighting position in the infrared range. The means of lighting in the visible range include at least one white light-emitting diode emitting a polychromatic white light with high radiant energy in the violet/blue wavelengths band and low residual energy in the red wavelengths band, that do not disturb a light intensifier night vision imaging system even if the white light-emitting diode is not filtered in the red wavelengths.

The present invention is also directed to a lighting system including a means of lighting in the visible range, means of lighting in the infrared range and switching means to make a choice between a lighting position in the visible range and a lighting position in the infrared range. The means of lighting in the visible range include at least one white light-emitting diode emitting a polychromatic white light with high radiant energy in the violet/blue wavelengths

band and low residual energy in the red wavelengths band, that do not disturb a light intensifier night vision imaging system even if the white light-emitting diode is not filtered in the red wavelengths.

Lang

Lang discloses an incandescent lamp or lightbulb that is used with night vision equipment. As noted at page 2, lines 24-27, the lightbulb of Lang is "sealed in a colored glass envelope that transmits light energy substantially only in that portion of the spectrum not detected by night vision equipment." The lightbulb has a colored glass envelope (used in the preferred embodiments) that has no detectable transmission of light above approximately 640 nm, the peak of transmission being in the 530-550 nm range (i.e., the lightbulb is filtered in the red wavelengths by the tinted glass). (see page 5, lines 15-24). Fig. 12 a curve shows the spectral radiance of the lightbulb on a logarithmic scale having a peak amplitude of 100% around the aviation green wavelength (555 nm) while the radiation of the blue violet/blue (~400-480 nm) comprises about 0.2-10% of the spectral radiance. At page 5, lines 6-11, Lang notes that "green light, green-blue light or amber light with no substantial component above 700 nm is usually preferred for use in conjunction with night vision equipment, with green light presently being preferred in accordance with the present invention." Table 1 on page 6 demonstrates that NVIS Green passes (i.e., "NVIS GREEN A: PASS"). Thus, Lang discloses a *filtered* lightbulb wherein the filter is the glass bulb which is part of the lightbulb.

Schweber

The present application, Application No. 09/636,565, filed on August 10, 2000 is a continuation of International Application No. PCT/FR99/00423, filed February 24, 1999. PCT International Application No. PCT/FR99/00423 and the present application claim foreign priority from French Application No. FR98 02310, filed on February 24, 1998. A certified copy of French Application No. 98 02310 was filed with the present application. **Thus, the present application has an effective filing date of *at least* February 24, 1999** (see 35 U.S.C. §§ 120, 363 and 365(c) and 37 C.F.R. § 1.53(b)).

35 U.S.C. § 102(a) recites, in pertinent part:

> (a) the invention was... described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent

35 U.S.C. § 102(b) recites, in pertinent part:

> (b) the invention was... described in a printed publication in this or a foreign country... more than one year prior to the date of the application for patent in the United States

35 U.S.C. § 102 (e) recites, in pertinent part:

> (e) The invention was described in....
>
> (2) A patent granted on an application for patent by another filed in the United States before the invention by the Applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in § 351(a)....[*emphasis added*] .

The article by Bill Schweber was published August 2, 2001. The article is not a U.S. Patent or Patent Application Publication. Accordingly, the Schweber article was not published before the effective filing date of the present application (i.e., at least February 24, 1999), and therefore, was also not possibly filed before the date of invention by the Applicants. Accordingly, Schweber does not quality as prior art under 35 U.S.C. § 102(a), (b) or (e), and therefore, Schweber also does not qualify as prior art under 35 U.S.C. § 103(a).

Jüstel

Jüstel discloses a light-emitting device having a UV-diode as the excitation source for the UV-radiation and a phosphor layer, including a mixture of three phosphors, which convert the UV-light of the UV-diode into visible, white light. The device is configured so that the UV-diode is embedded in a semi-spherical bowl of a polymeric material, which is arranged on a transparent substrate (front panel) 1. The three phosphor powders 2 are finely distributed in the polymer 3. The polymer bowl and the phosphor powders together constitute the phosphor

layer. The device in accordance with the invention may further comprise mirrors 4 for UV and visible light to improve the decoupling of light. The light-emitting device comprises a UV-diode with a primary emission of 300 nm $\leq \lambda \leq$ 370 nm and a phosphor layer including a combination of a blue-emitting phosphor having an emission band, with 430 $\leq \lambda \leq$ 490 nm, a green-emitting phosphor having an emission band, with 520 nm $\leq \lambda \leq$ 570 nm and a red-emitting phosphor having an emission band, with 590 nm$\leq \lambda \leq$ 630 nm, emits high-quality white light. The color-rendering index CRI is approximately 90 at a color temperature of 4000 K. The color rendition depends only on the composition of the three phosphors, not on the relation between converted and non-converted light, and hence can be readily controlled and regulated.

Shimizu

Shimizu discloses a white light emitting diode including a light emitting component using a semiconductor as a light emitting layer and a phosphor which absorbs a part of light emitted by the light emitting component and emits light of wavelength different from that of the absorbed light. The light emitting layer of the light emitting component is a nitride compound semiconductor and the phosphor contains garnet fluorescent material activated with cerium which contains at least one element selected from the group consisting of Y, Lu, Sc, La, Gd and Sm, and at least one element selected from the group consisting of Al, Ga and In, and is subject to less deterioration of emission characteristic even when used with high luminance for a long period of time. Light emitted by a light emitting component (LED) is usually emitted through an electrode which supplies electric power to the light emitting component. Emitted light is partly blocked by the electrode formed on the light emitting component resulting in a particular emission pattern, and is therefore not emitted uniformly in every direction. An LED which contains the fluorescent material, however, can emit light uniformly over a wide range without forming undesirable emission pattern because the light is emitted after being diffused by the fluorescent material. Although light emitted by the light emitting component (LED) has a monochromatic peak, the peak is broad and has high color rendering property. This characteristic makes an indispensable advantage for an application which requires wavelengths of a relatively wide range.

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Claim 1

Claim 1, as amended, recites:

> A combination of lighting means and of a light intensifier night vision imaging system, wherein the lighting means comprise a white light-emitting source comprising at least a white light-emitting diode or a white light-emitting panel which emits a polychromatic white light with high radiant energy in the violet/blue wavelengths band and with low residual energy in the red wavelengths band, the lighting means do not disturb the light intensifier night vision imaging system even if the white light-emitting source is not filtered in the red wavelengths.

Lang fails to disclose, teach or suggest a white light-emitting source comprising at least a white light-emitting diode or a white light-emitting panel which emits a polychromatic white light that does not disturb the light intensifier night vision imaging system even if the white light-emitting source is not filtered in the red wavelengths. Lang discloses a *filtered* lightbulb that is filtered in the red wavelengths (i.e., above 640 nm) wherein the filter is the glass bulb which is part of the lightbulb. The light source of Lang is the incandescent lamp within the colored glass bulb. Lang suggests that this is done without external filters because the filter is integral within the glass of the bulb itself.

In order to establish *prima facie* obviousness of a claimed invention, all the claimed limitations must be taught or suggested by the prior art. MPEP § 2143.03.

Lang does not disclose, teach or suggest a white light-emitting source comprising at least a white light-emitting diode or a white light-emitting panel which emits a polychromatic white light that does not disturb the light intensifier night vision imaging system even if the white light-emitting source is not filtered in the red wavelengths, as claimed in claim 1. Thus Lang does not disclose all of the claimed limitations of claim 1.

A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. MPEP § 2143.03.

Taken as a whole, Lang teaches making incandescent lamps or bulbs which have integral colored glass for filtering the light source in the red wavelengths and allowing light to pass in the green wavelengths in order be compatible with night vision equipment. This would lead one away from the present invention wherein light-emitting sources are chosen which emit a polychromatic white light with high radiant energy in the violet/blue wavelengths band and with low residual energy in the red wavelengths band and the lighting means do not disturb the light intensifier night vision imaging system even if the white light-emitting source is not filtered in the red wavelengths.

Further, if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. MPEP § 2143.01.

As mentioned above, Schweber does not qualify as prior art. Jüstel and Shimizu each disclose white-light emitting diodes. However, neither Jüstel or Shimizu discloses, teaches or suggests using white light emitting diodes in combination with night vision goggles, so there would be no motivation to combine Jüstel or Shimizu with the lightbulbs of Lang as suggested by the Examiner.

But, even if Lang were modified to include the white light emitting diodes of either Jüstel or Shimizu, the result would be a white light emitting diode encased in a colored glass envelope which filters light in the red wavelengths. Any other modification or combination would change the principle of operation of Lang wherein the main thrust of the invention is an integral sealed colored glass envelope that transmits light energy substantially only in the green spectrum. Thus, claim 1 is not *prima facie* obvious in view of Lang modified by Jüstel or Shimizu.

Accordingly, Applicants respectfully request that the rejection under 35 U.S.C. § 103(a) of independent claim 1 and of dependent claims 2-8, 10-13 and 43 should be withdrawn.